Chapter 5: Setting Columns

Most Common Mistakes:

1. Not checking to see if overall building footprint is square.
2. Not checking site grade to see if longer columns are required.
3. Improper column orientation in holes.
4. Placing wrong columns in wrong holes.
5. Lumber vendor ships larger dimension posts than on plans and they are used without Verifying other problems may be caused.
6. Not checking column rows at grade for alignment.
7. Not double checking column spacing before pouring concrete.

Why might corner columns be smaller sized? Each building column carries a load equal to ½ the distance to the next post *on each side!* This means corner columns are carrying about ½ other column's loads. Further, on an enclosed building, corner columns are braced in two directions by girts and wall steel (or other sidings).

Why might a building have 4x6 columns, instead of 6x6? As mentioned in lumber defects section **(Page 37),** 4x6 lumber and 6x6 lumber are graded under different "allowable defect" categories. 4x6 material is held to much more stringent guidelines. As an example, if the allowable defects from a 4x6 #2 grade, were applied to a 6x6, the 6x6 would have to be graded as Select Structural. Conversely, if allowable defects from a 6x6 #2 grade, were applied to a 4x6, the 4x6 would not even begin to make "utility" grade.

These allowable defect characteristics follow through to design values used for structural calculations. Without getting overly technical, the 4x6 #2 Fb (fiberstress in bending) value is nearly double the 6x6 #2 value.

A note about endwall columns: as a general rule, building plans require endwall columns to be long enough to extend to truss **BOTTOM** chord tops.

Distribute pressure treated columns to appropriate augured holes. Columns should be placed outside the building, perpendicular to the future wall they will become a part of, with any crown or bow up. **See Figure 5-1 and Figure 5-2**

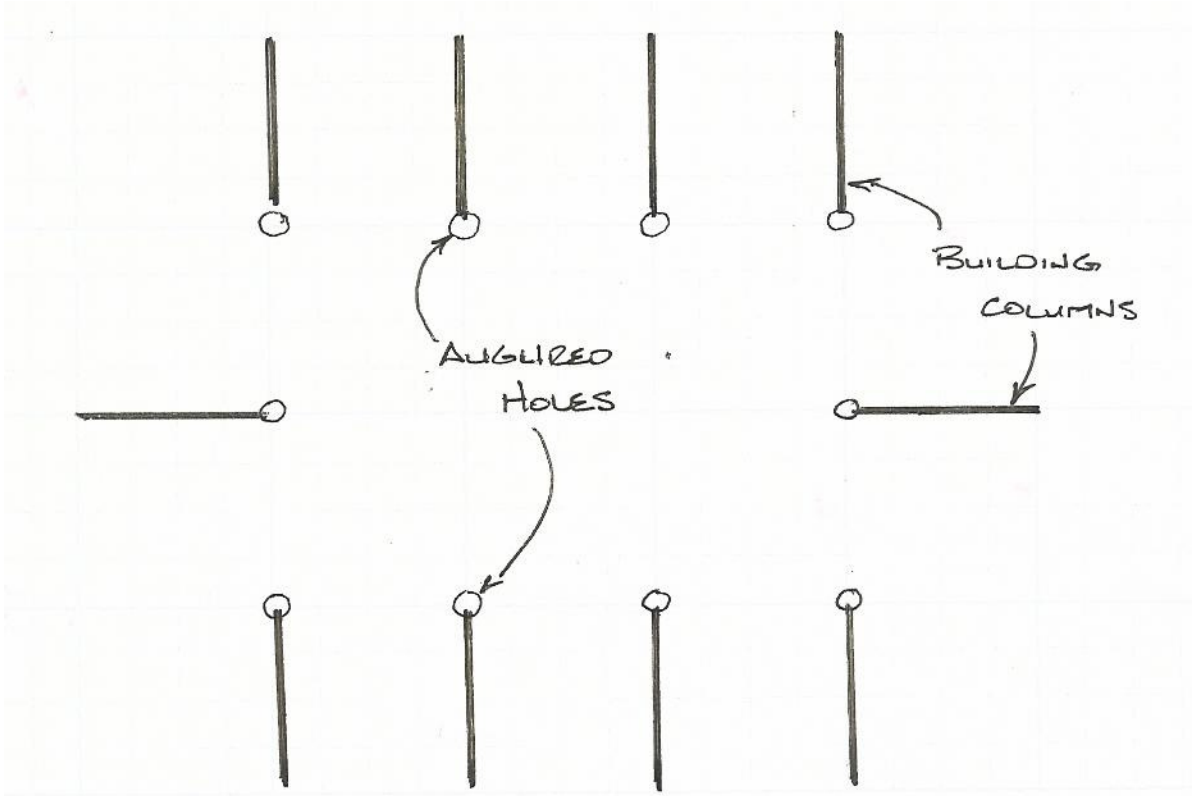

Figure 5-1

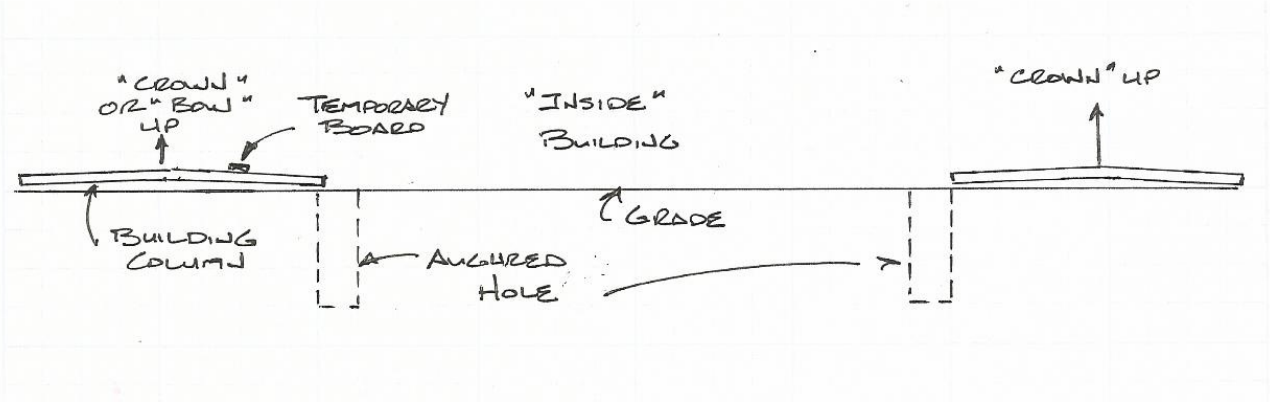

Figure 5-2

Use duplex nails, or similar fasteners, to attach a roof purlin at "column depth below grade" across what will become column "interior face" when placed in hole. **See Figure 5-3** Once stood in holes, this will allow for concrete to flow into space below bottom of each column in a mono-pour.

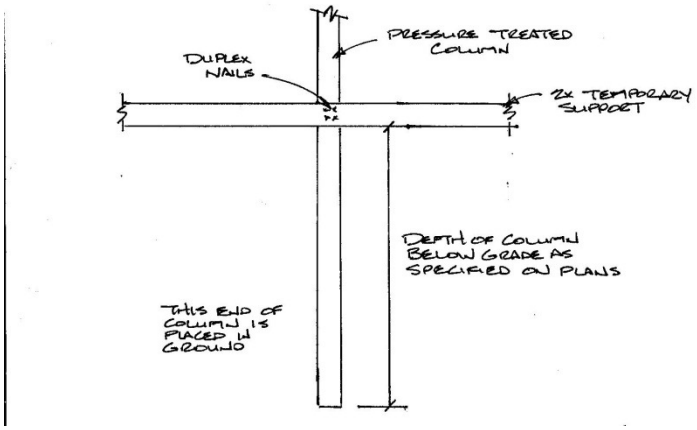

Figure 5-3

Photo shows columns suspended in holes by 2x4 horizontal.

Prior to placing columns in holes, remove any loose materials or debris from hole bottoms. Next, place columns in holes so any column crown or bow is "in". This is contrary to "stick" building stud walls and allows for column straightening in later steps. (See Glossary for *Crown* or *Bow*.) Temporarily lean towards building inside (away from string lines). If columns are not square (4x6, 6x8, 6x10 or similar), make certain to ***check column layout on building plans for proper orientation***. While normally the 6 inch face is towards wind (4-1/8" face for glu-laminated posts), this is *not* always the rule.

Starting with the four corners, stand posts in place. Corner post outside to outside is equal to building dimensions. Set posts to plumb at grade, unless the posts are perfectly straight (rarely) the top of the posts should now be leaning out.

Why lean posts out? Trees rarely grow as perfectly straight, so chances of getting a perfectly straight pressure treated timber are fairly small. By having posts lean out slightly, the roof system can be used to pull post tops in. This will take some (if not all) column crown or bow out, making for a much straighter finished wall.

 **IMPORTANT!** If glu-laminated posts have been provided set **perfectly plumb**.

Reinstall stringlines, once again moving 1-1/2 inches out from the nails driven in batter board tops (skirt board width). This is the same 1-1/2" from **Chapter 4**. As posts are set, align by setting post edges 1-1/2 inches ***inside string line.***

Remember to hold each post 1-1/2" **inside string lines**. Use girts (or if no walls, purlins) for temporary bracing. Consider premix truck access when placing bracing.

Locate columns in holes so there is at least four inches of space between column and any hole side.

In most cases the lower hole portion only (usually about 1/2 to 2/3) will be filled with pre-mix concrete. This is known as a **concrete collar**.

Determine concrete volume required:

Multiply ½ hole diameter (in feet) *squared*, x 3.14 x concrete collar depth (in feet) times hole number, divided by 27.

Like math in high school? This is what formula looks like:

$$\frac{(\frac{1}{2}\text{ X hole diameter})^2 \text{ X } 3.14 \text{ x concrete collar depth X \# of holes}}{27}$$

 Do not overfill any holes with concrete! Excess concrete may interfere with later skirt board installation. Doubly important, for animal safety (especially in equestrian facilities), is to have concrete column encasement end *below grade level*.

 We want to save time, effort and money. Often all three can be saved by having the local pre-mix concrete company deliver concrete for holes (even if a “short load” fee is charged), as opposed to mixing on site. If considering using “Sackcrete”, bags keep in mind over 60 - 60# bags make a concrete yard!

After pouring concrete collars, and once concrete has firmly set, backfill area around columns (above collar) with native soil. Tamp soil firmly every few inches to achieve good compaction. If native soil is not adequate, import good compactable material.

Establishing Grade

After verifying grade with a contractor’s level or transit, shoot from building center in all directions and locate grade marks on columns. Draw grade mark on each column with a pencil, parallel to ground.